UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/785,890	02/16/2001	Robert M. Moore JR.	SU-7073-L	5058

65895 7590 03/04/2009

ALBEMARLE CORPORATION
451 FLORIDA STREET
BATON ROUGE, LA 70801-1765

EXAMINER	
PRYOR, ALTON NATHANIEL	
ART UNIT	PAPER NUMBER
1616	
MAIL DATE	DELIVERY MODE
03/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/785,890	MOORE ET AL.	
	Examiner	Art Unit	
	ALTON N. PRYOR	1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/8/08*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date. _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Applicant's arguments filed 12/8/09 have been fully considered but they are not persuasive. See argument below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Goodenough (USPN 3558503; 1/26/71 – Exhibit 1003).

Having analyzed instant claims, we turn to the evidence. Goodenough discloses aqueous bromine solutions with bromine values of about 0.01 to about 100,000 ppmw useful for bleaching processes, treatment of swimming pool water, and disinfection. See column 1, lines 13-61. Specifically, Goodenough teaches solutions made by a process comprising providing an aqueous solution of bromine and contacting therewith a bromine value stabilizer (e.g., sulfamic acid) and an effective amount of magnesium hydroxide sufficient to achieve a final pH in the system ranging from about 8 to about 10. See column 2, lines 1-40. In addition, Goodenough teaches that the bromide solutions to be treated by the disclosed process may further contain chlorides in the form of brine solutions such as sodium chloride or calcium chloride. See column 2, lines 16-22. Goodenough discloses that the molar ratio of bromine to nitrogen is from about 2 to about 0.5, which would have indicated to one of ordinary skill in the art that the

atomic ratio of nitrogen to active bromine (N:Br) is from about 0.5 to about 2. See column 1 lines 66-69. Goodenough teaches a Solution A "prepared by admixing 6.05 grams of sulfamic acid with about 500 grams of water, followed by addition of about 3.65 grams of magnesium hydroxide and about 5 grams of bromine." See example 3, column 4 lines 66-69. Goodenough states the solution was placed in a brown ultraviolet light-screening bottle for about 4 days, thus indicating to one of ordinary skill in the art (based on the exothermic nature of the reaction disclosed in the Goodenough) that cooling occurred. Hence, Goodenough's reaction is exothermic.

Instant invention alleges that the use of bromine chloride in lieu of bromine results in a nonobvious difference. This contention lacks merit for a number of reasons. First, instant independent claims recite pH of 13 or greater. Second, nowhere does the instant specification point to any experimental evidence establishing any difference, let alone a patentable difference, between a biocide within the scope of instant claim 11 and Goodenough's final bromine compound where sodium chloride or calcium chloride is used as a starting material along with bromine. Note it is inherent that the combination of bromine with sodium chloride or calcium chloride in the Goodenough patent would result in the BrCl compound employed in instant invention.

Assuming that some difference results by practicing the process recited in instant product claims, instant specification has not shown that this difference in the preparation process results in a product of claim 11 and 21 being different from Goodenough's product. One having ordinary skill in the art would have been led to exchange Goodenough's bromine with bromine chloride with the expectation that these reactants

would be interchangeable as bromine sources in the production of bromine-based biocides and that bromide chloride would provide advantages over bromine.

With respect to instant claims 11 and 21, which state that the solution's pH is about 13 or greater. Note that the pH of the aqueous alkali sulfamate solution in Goodenough's Example 3 would be about 13.9. (Exhibit 1001). Goodenough's pH of around 13.9 makes obvious the instantly claimed pH of about 13 or greater. It would have been obvious to one having ordinary skill in the art at the time of the filing of instant to provide an initial solution as set forth in instantly claimed subject matter having a pH between 13 and 14, which encompasses the claimed range, in order to maintain the storage stability of the final product.

The subject matter of the instant claims 12,13,15,17,18,20-23,25,27,28,30 reciting an active bromine content of "at least about 100,00 ppm and an atomic ratio of nitrogen to active bromine of greater than 0.93 would have been obvious to a person having ordinary skill in the art because the prior art ranges and instantly claimed ranges overlap.

Now regarding claim 10, one having ordinary skill in the art would have found the method of instant claim 10 obvious because Goodenough teaches the use of the composition in water treatment. See column 1 lines 13-61.

Response to Applicants' argument

Applicants argue that they are unable to identify in Goodenough a description of a process utilizing an amount of a hydroxide additive capable to achieve a final pH of about 13 or greater. Applicants further argues that Dr. McKinnie in paragraph 101 notes

that magnesium hydroxide is used in Example 3. The low solubility of magnesium hydroxide in water makes it impossible to achieve a pH greater than or equal to 13. The opinions of Drs. Yang and Wojtowicz relied upon by the Examiner do not directly address the issue of whether it would have been obvious to add bromine or bromine chloride to an alkali metal sulfamate which is maintained at pH 13.0 or greater. The Examiner argues that the pH of the aqueous alkali sulfamate solution in Goodenough's Example 3 would be at a pH of about 13.9 (Exhibit 1001) based on the combination of chemicals. In addition, the invention is not limited to Example 3. Note Goodenough encourages the use of alkali hydroxides (column 2 liens 35-40). If the magnesium hydroxide is replaced by an alkali hydroxide, which the Goodenough encourages, the pH would actually be about 13.9.

Applicants argue that they are unable to identify a teaching or suggestion in Goodenough to use bromine chloride. If Mills paper motivated one to modify Goodenough to substitute BrCl for Br, an artisan would not have maintained the pH of the alkali metal sulfamate solution at about 13. Applicant refers to Kumar to support that Br and BrCl are non-equivalent. The Examiner argues that Goodenough produces BrCl from the combination of calcium chloride or sodium chloride with bromine. Based on this teaching there is no need to substitute the BrCl for Br in Goodenough since Goodenough process produces BrCl.

Applicants argue that there is no indication in Goodenough that N-chlorosulfamate would be produced as it is produced in the instant process. Applicants provide reference to Analytical Element Modeling of Coastal Aquifers and Current

Technology Chlorine Analysis for Water and Waste to support that Goodenough's process would not produce N-chlorosulfamate. Applicants make references to numerous patents on pages 15-17 of their response to support that at the date of Applicants' invention bromine based biocides have significant advantages over chlorine based biocides. The Examiner maintains that Goodenough produces BrCl from the combination of calcium chloride or sodium chloride with bromine. The BrCl produced from the combination reacts with sulfamate or sulfamic acid to yield N-chlorosulfamate (chlorine based biocide) and N-bromosulfamate (bromine based biocide).

With respect to the order of combining ingredients, Goodenough discloses that the order of combining ingredients is not critical and that Example 3 in Goodenough closely resembles the order of combining the ingredients as claimed. Absent a showing of the criticality of the order of combining ingredients, Goodenough makes obvious the instant order of combining ingredients.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goodenough (USPN 3558503; 1/26/71 – Exhibit 1003) in view of Declaration of B. Gary McKinnie (Exhibit 1001), The Second Declaration of B. Gary McKinnie, 2/14/05 (Exhibit 1073) Mills et al., Bromine Chloride: an Alternative to Bromine, Ind. Eng. Chem. Prod.

Res. Develop., vol. 12, No. 3, 1973, pp.161160-165 (Exhibit 2014), Declaration of Dr. Jack Mills, 12/6/04 (Exhibit 2021), Expert Declaration of Dr. Shunong Yang, 12/6/04 (Exhibit 2022), and Expert Declaration of John A. Wojtowicz, 12/7/04 (Exhibit 2023).

Having construed instant claims, we turn to the evidence. Goodenough discloses aqueous bromine solutions with bromine values of about 0.01 to about 100,000 ppmw useful for bleaching processes, treatment of swimming pool water, and disinfection. See column 1, lines 13-61. Specifically, Goodenough teaches solutions made by a process comprising providing an aqueous solution of bromine and contacting therewith a bromine value stabilizer (e.g., sulfamic acid) and an effective amount of magnesium hydroxide sufficient to achieve a final pH in the system ranging from about 8 to about 10. See column 2, lines 1-40. In addition, Goodenough teaches that the bromide solutions to be treated by the disclosed process may further contain chlorides in the form of brine solutions such as sodium chloride or calcium chloride. See column 2, lines 16-22. According to Dr. McKinnie, the reaction the reaction in the Goodenough would be exothermic. See exhibit 1001. Goodenough discloses that the molar ratio of bromine to nitrogen is from about 2 to about 0.5, which would have indicated to one of ordinary skill in the art that the atomic ratio of nitrogen to active bromine (N:Br) is from about 0.5 to about 2. See column 1 lines 66-69. Goodenough teaches a Solution A “prepared by admixing 6.05 grams of sulfamic acid with about 500 grams of water, followed by addition of about 3.65 grams of magnesium hydroxide and about 5 grams of bromine.” See example 3, column 4 lines 66-69. Goodenough states the solution was placed in a brown ultraviolet light-screening bottle for about 4 days, thus indicating to one of

ordinary skill in the art (based on the exothermic nature of the reaction disclosed in the Goodenough) that cooling occurred.

Given the close similarities between the preparation processes and starting materials stated in instant claims 11-30 and the prior art, it is reasonable to conclude that the claimed "composition" and the stable prior art final bromine compound as described in Goodenough are essentially the same.

The evidence of record supports a prima facie case of unpatentability against instant claims 11-30.

Moore alleges that the use of bromine chloride in lieu of bromine results in a nonobvious difference. In support of this contention, Moore relies on the Second Declaration of B. Gary McKinnie.

This contention lacks merit for a number of reasons. First, instant independent claims 11 and 21 recites that the pH value is 13 or greater. Second, nowhere does the instant specification point to any experimental evidence establishing any difference, let alone a patentable difference, between a biocide within the scope of instant claims 11 and 21 and Goodenough's final bromine compound where sodium chloride or calcium chloride is used as a starting material along with bromine.

Assuming that some difference results by practicing the process recited in instant product claims, instant specification has not shown that this difference in the preparation process results in a product of claims 11 and 21 different from Goodenough's product. According to Jack F. Mills & John A. Schneider, "Bromine Chloride: an Alternative to Bromine," 12 Ind. Eng. Chem. Prod. Res. Develop. 160-165, no. 3 (1973) (Exhibit 2014,

"Mills paper"), bromine chloride and bromine are interchangeable brominating agents and the former offers, inter alia, important cost and ecological advantages. (Mills paper at 160. One having ordinary skill in the art would have been led to exchange Goodenough's bromine with bromine chloride with the expectation that these reactants would be interchangeable as bromine sources in the production of bromine-based biocides and that bromide chloride would provide advantages over bromine. This conclusion is in agreement with: (1) Dr. Mills' declaration, which based on the teaching of the Mills paper, pronounces that the interchange of bromine chloride for bromine in instant invention (claims) would have been obvious (Exhibit 2021) as well as (2) Dr. Yang's testimony, stating that "substitution of bromine chloride for bromine is obvious (Exhibit 2022).

With respect to instant claims 11 and 21, which states that the solution's pH is about 13.0 or greater. Dr. McKinnie, has calculated that the pH of the aqueous alkali sulfamate solution in Goodenough's Example 3 would be about 13.9. (Exhibit 1001). Goodenough's pH of around 13.9 makes obvious the instantly claimed pH of about 13 or greater in instant claims 11 and 21. Moreover, Drs. Yang and Wojtowicz both favor that it would have been obvious to one having ordinary skill in the art at the time of the filing of instant to provide an initial solution as set forth in instantly claimed subject matter having a pH between 13 and 14, which encompasses the claimed range, in order to maintain the storage stability of the final product. Exhibits 2022 and 2023.

The subject matter of the instant claims reciting an active bromine content of "at least about 100,00 ppm and an atomic ratio of nitrogen to active bromine of greater than

0.93 would have been obvious to a person having ordinary skill in the art because the prior art ranges and instantly claimed ranges overlap.

Response to Applicants' argument

Applicants argue 1) "newly added claims 21-30 each recite a minimum pH of "at least about 13.0" for an alkali metal sulfamate solution during addition of bromine chloride"; 2) "newly added claims 21-30 is an aqueous biocidal solution rather than a stabilized bromine-based biocidal compound". The applicant seeks a scope which is not merely limited to stabilized halogen compound, or limited to the aqueous biocidal solution produced by the process of these claims; 3) Dr. McKinnie' declaration discusses the composition of an aqueous biocidal solution produced by the methods recited in claims 21-30. Dr. McKinnie in his declaration determined that addition of bromine chloride to an alkali metal sulfamate solution which is maintained at a pH of at least 13.0 during the addition of BrCl results in an aqueous biocidal composition comprising an about 4:1 molar ratio of stabilized bromine (N-bromosulfamate) to stabilized chlorine (N-chlorosulfamate); 4) The aqueous biocidal compositions of new claims 21-30 comprise N-chlorosulfamate and thus differs from the composition comprising N-bromosulfamate produced by Goodenough. Examiner argues that Goodenough in Example 8 states that the pH of the solution is from about 13 to about 13.7 and note that the pH of the aqueous alkali sulfamate solution in Goodenough's Example 3 would be about 13.9. This pH disclosed in Goodenough makes obvious the instant pH of about 13 or greater in instant claims 11 and 21. Goodenough teaches the combination of base with sulfamic acid and a bromine source in water which reads on

instant claims to aqueous biocidal composition. Note that BrCl is the bromine source in instant invention and the Applicants have not shown unexpected results for BrCl in comparison to bromine. The instant claims do not recite that the instant composition comprises N-chlorosulfamate. BrCl serves as a bromine source to produce bromosulfamate not chlorosulfamate.

Applicants argue that they are unaware of any requirement that the specification of the presently pending application provide data indicating that the claimed processes and products differ from the products and processes taught in the Goodenough patent. The Examiner argues that when it is suggested that the prior art, in case the Goodenough patent, gives the same product and process as claimed, unexpected results assist in overcoming the prior art.

Applicants argue that they are unable to identify in Goodenough a description of a process utilizing an amount of a hydroxide additive capable to achieve a final pH of about 13 or greater. Applicants further argues that Dr. McKinnie in paragraph 101 notes that magnesium hydroxide is used in Example 3. The low solubility of magnesium hydroxide in water makes it impossible to achieve a pH greater than or equal to 13. The opinions of Drs. Yang and Wojtowicz relied upon by the Examiner do not directly address the issue of whether it would have been obvious to add bromine or bromine chloride to an alkali metal sulfamate which is maintained at pH 13.0 or greater. The Examiner argues that the pH of the aqueous alkali sulfamate solution in Goodenough's Example 3 would be at a pH of about 13.9 (Exhibit 1001) based on the combination of chemicals. In addition, the invention is not limited to Example 3. Note Goodenough

encourages the use of alkali hydroxides (column 2 liens 35-40). If the magnesium hydroxide is replaced by an alkali hydroxide, which the Goodenough encourages, the pH would actually be about 13.9.

Applicants argue that they are unable to identify a teaching or suggestion in Goodenough to use bromine chloride. If Mills paper motivated one to modify Goodenough to substitute BrCl for Br, an artisan would not have maintained the pH of the alkali metal sulfamate solution at about 13. Applicant refers to Kumar to support that Br and BrCl are non-equivalent. The Examiner argues that Goodenough produces BrCl from the combination of calcium chloride or sodium chloride with bromine. Based on this teaching there is no need to substitute the BrCl for Br in Goodenough since Goodenough process produces BrCl.

Applicants argue that there is no indication in Goodenough that N-chlorosulfamate would be produced as it is produced in the instant process. Applicants provide reference to Analytical Element Modeling of Coastal Aquifers and Current Technology Chlorine Analysis for Water and Waste to support that Goodenough's process would not produce N-chlorosulfamate. Applicants make references to numerous patents on pages 15-17 of their response to support that at the date of Applicants' invention bromine based biocides have significant advantages over chlorine based biocides. The Examiner maintains that Goodenough produces BrCl from the combination of calcium chloride or sodium chloride with bromine. The BrCl produced from the combination reacts with sulfamate or sulfamic acid to yield N-chlorosulfamate (chlorine based biocide) and N-bromosulfamate (bromine based biocide).

With respect to the order of combining ingredients, Goodenough discloses that the order of combining ingredients is not critical and that Example 3 in Goodenough closely resembles the order of combining the ingredients as claimed. Absent a showing of the criticality of the order of combining ingredients, Goodenough makes obvious the instant order of combining ingredients.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Telephonic Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alton N. Pryor whose telephone number is 571-272-0621. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alton N. Pryor/
Primary Examiner, Art Unit 1616